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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants:	Eric Anderson	§	Art Unit:	2166
		§		
Serial No.:	10/600,601	§		
		§	Examiner:	Usmaan Saeed
Filed:	June 20, 2003	§		
		§		
For:	Adaptive Migration Planning	§	Atty. Dkt. No.:	100202201-1
	and Execution	§		(HPC.0316US)

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Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

APPEAL BRIEF PURSUANT TO 37 C.F.R § 41.37

Sir:

The final rejection of claims 1-15, 17-22, 24-27, and 29-34 is hereby appealed.

I.   REAL PARTY IN INTEREST

The real party in interest is the Hewlett-Packard Development Company, L.P.

II.   RELATED APPEALS AND INTERFERENCES

None.

III.   STATUS OF THE CLAIMS

Claims 1-15, 17-22, 24-27, and 29-34 have been finally rejected and are the subject of

this appeal.

Claims 16, 23, and 28 have been cancelled.

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Date of Deposit: _January 3, 2007_

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HEWLETT-PACKARD COMPANY
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PATENT APPLICATION

ATTORNEY DOCKET NO. ___100202201-1___

IN THE
UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s):   Eric Anderson

Application No.: 10/600,601

Filing Date: 06-20-2003

Confirmation No.: 5490

Examiner: Usmann Saeed

Group Art Unit: 2166

Title: Adaptive Migration Planning and Execution

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Commissioner For Patents
PO Box 1450
Alexandria, VA 22313-1450

TRANSMITTAL OF APPEAL BRIEF

Transmitted herewith is the Appeal Brief in this application with respect to the Notice of Appeal filed on ___10-31-2006___.

The fee for filing this Appeal Brief is (37 CFR 1.17(c)) $500.00.

(complete (a) or (b) as applicable)

The proceedings herein are for a patent application and the provisions of 37 CFR 1.136(a) apply.

☐ (a) Applicant petitions for an extension of time under 37 CFR 1.136 (fees: 37 CFR 1.17(a)-(d)) for the total number of months checked below:

☐ 1st Month $120   ☐ 2nd Month $450   ☐ 3rd Month $1020   ☐ 4th Month $1590

☐ The extension fee has already been filed in this application.

☒ (b) Applicant believes that no extension of time is required. However, this conditional petition is being made to provide for the possibility that applicant has inadvertently overlooked the need for a petition and fee for extension of time.

Please charge to Deposit Account 08-2025 the sum of ___$ 500___. At any time during the pendency of this application, please charge any fees required or credit any over payment to Deposit Account 08-2025 pursuant to 37 CFR 1.25. Additionally please charge any fees to Deposit Account 08-2025 under 37 CFR 1.16 through 1.21 inclusive, and any other sections in Title 37 of the Code of Federal Regulations that may regulate fees.

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Typed Name: Ginger Yount
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Rev 10/06a (ApBrief)

Respectfully submitted,

Eric Anderson

By_____

Dan C. Hu

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IV. STATUS OF AMENDMENTS

No amendment after final has been submitted.

V. SUMMARY OF THE CLAIMED SUBJECT MATTER

The following provides a concise explanation of the subject matter defined in each of the independent claims involved in the appeal, referring to the specification by page and line number and to the drawings by reference characters, as required by 37 C.F.R. § 41.37(c)(1)(v). Each element of the claims is identified by a corresponding reference to the specification and drawings where applicable. Note that the citation to passages in the specification and drawings for each claim element does not imply that the limitations from the specification and drawings should be read into the corresponding claim element.

Independent claim 1 recites a method for performing adaptive migration and execution, the method comprising:

obtaining (Fig. 3A:205; Fig. 3B:205) a plan generated by a planner (Fig. 2:105) executable in a computer (Spec., 11:7-16; 15:7-8; 19:1-2);

adapting (Fig. 3A:210; Fig. 3B:252) the plan to satisfy migration constraints (Spec., 15:8-9; 20:11-21:13);

executing (Fig. 3A:215, 225; Fig. 3B:253, 254, 225) at least one move of a data chunk in the plan (Spec., 15:15-19; 19:7-12);

feeding back information relating to the execution of the at least one move to the planner (Spec., 11:19-12:3; 17:15-17; 19:13-15); and

modifying the plan by the planner in response to the information (Spec., 11:21-23; 16:5-7; 19:13-14).

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Independent claim 10 recites a method for performing adaptive migration and execution, the method comprising:

obtaining (Fig. 3A:205; Fig. 3B:205) a plan created by a planner (Fig. 2:105) executable in a computer;

determining (Fig. 3A:210; Fig. 3B:252) all valid moves in the plan (Spec., 15:8-9; 20:11-21:13);

executing (Fig. 3A:215, 225; Fig. 3B:253, 254, 225) a valid move (Spec., 15:15-19; 19:7-12);

feeding back information relating to execution of the valid move to the planner (Spec., 11:19-12:3; 17:15-17; 19:13-15); and

if at least one additional move is required, modifying the plan by the planner based on the information (Spec., 11:21-23; 16:5-7; 19:13-14).

Independent claim 14 recites an article of manufacture, comprising:

a machine-readable medium having stored thereon instructions to:

obtain (Fig. 3A:205; Fig. 3B:205) a plan (Spec., 11:7-16; 15:7-8; 19:1-2);

adapt (Fig. 3A:210; Fig. 3B:252) the plan to satisfy migration constraints (Spec., 15:8-9; 20:11-21:13);

execute (Fig. 3A:215, 225; Fig. 3B:253, 254, 225) at least one move of a data chunk in the plan (Spec., 15:15-19; 19:7-12);

modifying the plan based on feedback configuration information regarding in-progress execution of the at least one move (Spec., 11:21-23; 16:5-7; 19:13-14); and

execute another move in the modified plan (Spec., 16:4-8; 19:15-20).

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Independent claim 15 recites an apparatus for adaptive migration, the apparatus comprising:

> a planner (Fig. 2:105) configured to generate a migration plan based upon configuration information (Spec., 11:7-8);

> an adapter (Fig. 2:115) configured to receive the plan from the planner, to receive migration constraints information, target configuration information and current configuration information, and to transmit the configuration information to the planner (Spec., 10:18-11:16; 13:1-2; 13:15-14:6); and

> at least one executor (Fig. 2:110) configured to execute a move in the plan, wherein the configuration information relates to execution of the move (Spec., 11:17-23; 15:18-24; 19:10-12).

VI.   GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

A.   **Claims 1-15, 17-22, 24-27, And 29-34 Rejected Under 35 U.S.C. § 103 Over U.S. Patent No. 6,381,619 (Borowsky) In View Of U.S. Patent No. 5,845,258 (Kennedy).**

VII.   ARGUMENT

The claims do not stand or fall together. Instead, Appellant presents separate arguments for various independent and dependent claims. Each of these arguments is separately argued below and presented with separate headings and sub-headings as required by 37 C.F.R. § 41.37(c)(1)(vii).

A.   **Claims 1-15, 17-22, 24-27, And 29-34 Rejected Under 35 U.S.C. § 103 Over U.S. Patent No. 6,381,619 (Borowsky) In View Of U.S. Patent No. 5,845,258 (Kennedy).**

1.   **Claims 1-10, 12, 13, 30, and 31.**

Independent claim 1 was rejected as being obvious over the asserted combination of Borowsky and Kennedy. It is respectfully submitted that a *prima facie* case of obviousness has not been established with respect to claim 1 for at least the following reasons: (1) no motivation or suggestion existed to combine the teachings of Borowsky and Kennedy; and (2) the references

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when combined do not teach or suggest all elements of claim 1. *See* M.P.E.P. § 2143 (8th ed.,

Rev. 5), at 2100-126.

As conceded by the Examiner, Borowsky fails to disclose either the feeding back task or

the modifying task of claim 1. 7/31/2006 Office Action at 4. However, the Examiner relied

upon Kennedy as disclosing the features that are missing from Borowsky. *Id.* Appellant

respectfully submits that the combination of Borowsky and Kennedy is improper.

Borowsky describes a migration planner to migrate a data system from an initial

configuration to a goal configuration represented as 10 and 14, respectively, in Fig. 1 of

Borowsky. In performing the migration, data stores are moved, or migrated, among storage

devices under the direction of a control 28. Borowsky, 3:48-51. As taught by Borowsky, a

"migration plan," or more simply a "plan," includes a plurality of data migrations or moves from

one configuration to another. Borowsky, 4:1-2, 26-27. A move represents the migration of a

data store from one storage device to another storage device. Borowsky, 4:4-9. Thus, the

"plans" referred to in Borowsky refer to plans that contain moves of data stores between storage

devices.

On the other hand, the "plans" referred to in Kennedy are completely different types of

plans. As explained in Kennedy, a plan 14 represents "a current plan for a user environment."

Kennedy, 3:54. In the embodiment described by Kennedy, the plan 14 "represents a plan for a

manufacturing environment." Kennedy, 3:55-56. In the *manufacturing* environment, constraints

are defined that include capacity, material availability, and due date of shipments. Kennedy,

3:59-61. Kennedy describes a technique for improving the plan that is initially generated by a

planning engine 12. As described by Kennedy, the planning engine 12 compares a plan 14 to the

environment 16 to generate problems 18. Kennedy, 4:2-3. Through a user interface 36, the user

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can communicate with the planning system 10 to allow a user to control operation of the planning engine 12, and the user can resolve problems to adjust the plan 14 such that the plan 14 "approaches an optimum plan." Kennedy, 4:56-63.

From the foregoing, it is clear that the plans generated in Borowsky and Kennedy are completely different. Borowsky teaches plans that involve data migration, whereas Kennedy teaches plans for use in a manufacturing environment. Therefore, a person of ordinary skill in the art clearly would not have been motivated to incorporate the teachings regarding adjustment of plans in a manufacturing environment, as taught by Kennedy, in the context of developing plans for migrating data among storage devices, as taught by Borowsky.

Even more fundamentally, Kennedy clearly does not provide any suggestion of feeding back information relating to the execution of the at least *one move* to the planner, as explicitly recited in claim 1. In making the rejection, the Examiner stated that "Kennedy discloses 'feeding back information relating to the to the [sic] planner ....'" 7/31/2006 Office Action at 4. In the quotation, the Examiner appears to have intentionally left out the language "at least one move" that is recited in claim 1. It appears that the Examiner recognized that Kennedy provides no suggestion of feeding back information relating to execution of a move to the planner.

Claim 1 explicitly defines what this move is: in claim 1, the move refers to the move of a data chunk in the plan (as recited in "executing at least one move of a data chunk in the plan" in line 5 of claim 1. In contrast to the subject matter of claim 1, Kennedy describes a planner than compares a plan to a *manufacturing* environment to generate problems, and that allows a user to resolve the problems to adjust the plan. Kennedy refers to the user being able to change the plan manually or automatically. Kennedy, 5:13-17. However, there is no suggestion by Kennedy that information pertaining to execution of a *move* of a data chunk in a plan is fed back to a planner to

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allow the planner to modify the plan in response to the information relating to the execution of the *move* of the data chunk.

In view of the foregoing, there clearly did not exist any motivation or suggestion to modify the teachings of Borowsky with the teachings of Kennedy. Therefore, a *prima facie* case of obviousness has not been established with respect to claim 1 for at least this reason.

Also, it is respectfully submitted that the hypothetical combination of Borowsky and Kennedy does not teach or suggest all elements of claim 1. As conceded by the Examiner, Kennedy fails to disclose the feeding back task and the modifying task of claim 1. Moreover, as explained above, Kennedy fails to teach or suggest feeding back information relating to execution of at least one *move of a data chunk* to the planner, and then modifying the plan by the planner in response to such information relating to the execution of the at least one *move of the data chunk*. Therefore, since neither Borowsky nor Kennedy teaches or suggests the feeding back task and the modifying task of claim 1, it is respectfully submitted that the hypothetical combination of these references also fails to teach or suggest these elements. Therefore, the *prima facie* case of obviousness is defective for this additional reason.

Independent claim 10 is similarly allowable over the asserted combination of Borowsky and Kennedy.

Dependent claims are allowable for at least the same reasons as corresponding independent claims. In view of the foregoing, reversal of the final rejection of the above claims is respectfully requested.

2.   Claims 14, 32, and 33.

Independent claim 14 is allowable since neither Borowsky nor Kennedy teaches or suggests modifying a plan based on feedback configuration information regarding in-progress

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execution of a move of a data chunk in the plan. Moreover, contrary to the assertion in the Office Action, Kennedy also further fails to disclose or suggest modifying the plan based on feedback configuration information regarding *in-progress* execution of the at least one move. There is no reference or hint regarding the plan in Kennedy being modified based on in-progress execution of a move of a data chunk. This is a further reason that claim 14 is non-obvious over Borowsky and Kennedy.

Moreover, as explained above, no motivation or suggestion existed to combine the teachings of Borowsky and Kennedy. Therefore, a *prima facie* case of obviousness has not been established with respect to claim 14 (and its dependent claims) for at least the foregoing reasons.

In view of the foregoing, reversal of the final rejection of the above claims is respectfully requested.

3.   Claims 15, 17-22 and 24-27.

A *prima facie* case of obviousness has also not been established with respect to independent claim 15. Claim 15 recites a planner that is configured to generate a migration plan based upon configuration information, and an executor configured to execute a move in the plan, where the configuration information that the planner uses to generate the migration plan relates to execution of the move. Neither Borowsky nor Kennedy teaches or suggests a planner that is able to generate a configuration plan based upon configuration information that relates to execution of a *move*. Therefore, the hypothetical combination of Borowsky and Kennedy does not teach or suggest all elements of claim 15. Also, as discussed above, no motivation or suggestion existed to combine the teachings of Borowsky and Kennedy to achieve the claimed subject matter.

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A *prima facie* case of obviousness has thus not been established with respect to claim 15 (and its dependent claims).

In view of the foregoing, reversal of the final rejection of the above claims is respectfully requested.

4.   Claim 11.

Claim 11 depends from claim 10, and is allowable for at least the same reasons as claim 10. Moreover, claim 11 recites determining if an executor is available, where executing the valid move is performed by the available executor. With respect to claim 11, the Examiner cited column 5, lines 59-64, of Borowsky as disclosing the recited element. 7/31/2006 Office Action at 11. The cited passage of Borowsky refers to a program processing possible moves, and comparing a current configuration with a goal configuration to determine if the goal configuration has been met. However, the cited passage of Borowsky does not disclose or suggest determining if an executor is available. Therefore, this is a further reason that a *prima facie* case of obviousness has not been established with respect claim 11.

Reversal of the final rejection of the above claim is respectfully requested.

5.   Claim 29.

Claim 29 depends from claim 1, and is thus allowable for at least the same reasons as claim 1. Moreover, claim 29 recites that the method of claim 1 further includes executing at least a second move of a data chunk in the *modified* plan, and feeding back information relating to the execution of the at least second move to the planner. Neither Borowsky nor Kennedy teaches or suggests feeding back information relating to the execution of a second move of a data chunk in the modified plan to the planner, or modifying the plan by the planner in response to

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information relating to execution of the second move of a data chunk in the modified plan. This

is a further reason that claim 29 is allowable.

Reversal of the final rejection of the above claim is respectfully requested.

6.   Claim 34.

Claim 34 depends from claim 15, and is thus allowable for at least the same reasons as

claim 15. Moreover, claim 34 recites that the adapter is configured to further track configuration

information relating to execution of the move and execution of other moves, and that the planner

is configured to iteratively modify the migration plan as the tracked configuration information is

repetitively fed back to the planner. Borowsky and Kennedy clearly do not teach or suggest a

planner to iteratively modify a migration plan as tracked configuration information (that relates

to execution of moves) is repetitively fed back to the planner.

Reversal of the final rejection of the above claim is respectfully requested.
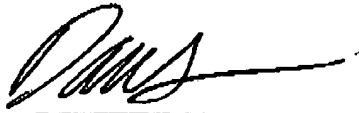

VIII. CONCLUSION

In view of the foregoing, reversal of all final rejections and allowance of all pending

claims is respectfully requested.

Respectfully submitted,

Date:_____   _____

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APPENDIX OF APPEALED CLAIMS

The claims on appeal are:

1   1.   A method for performing adaptive migration and execution, the method comprising:
2   obtaining a plan generated by a planner executable in a computer;
3   adapting the plan to satisfy migration constraints;
4   executing at least one move of a data chunk in the plan;
5   feeding back information relating to the execution of the at least one move to the planner;
6   and
7   modifying the plan by the planner in response to the information.

1   2.   The method of claim 1, wherein the steps in the method are repeated until no moves are
2   pending.

1   3.   The method of claim 2, further comprising:
2   waiting for all in-progress executions of moves to complete after no moves are pending.

1   4.   The method of claim 1, further comprising:
2   waiting for a move to complete if the adaptation of the plan indicates no moves meet the
3   migration constraints.

1   5.   The method of claim 1, further comprising:
2   estimating load value information; and
3   using the load value information to assist in modifying the plan.

1   6.   The method of claim 1, wherein adapting the plan comprises:
2   selecting at least one step from the following: pruning at least one move that violates a
3   migration constraint; selecting a largest set of moves that do not violate a migration constraint;
4   and skipping a move that violates a migration constraint.

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1 7.   The method of claim 1, further comprising:

2   treating a data chunk as existing in an old location and new location while a move is in

3 progress.

1 8.   The method of claim 1, further comprising:

2   pruning moves that violate an access rule when a move is in progress, wherein the pruned

3 moves are not selected for inclusion in the plan.

1 9.   The method of claim 7, wherein the step of treating the data chunk comprises:

2   considering the data chunk as decreasing a per-node free space information at both the

3 old location and the new location when a move is in progress.

1 10.   A method for performing adaptive migration and execution, the method comprising:

2   obtaining a plan created by a planner executable in a computer;

3   determining all valid moves in the plan;

4   executing a valid move;

5   feeding back information relating to execution of the valid move to the planner; and

6   if at least one additional move is required, modifying the plan by the planner based on the

7 information.

1 11.   The method of claim 10, further comprising:

2   determining if an executor is available, wherein executing the valid move is performed by

3 the available executor.

1 12.   The method of claim 10, wherein the steps in the method are repeated until no moves are

2 pending.

1 13.   The method of claim 12, further comprising:

2   waiting for all in-progress execution of moves to complete after no moves are pending.

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1   14.   An article of manufacture, comprising:

2   a machine-readable medium having stored thereon instructions to:

3   obtain a plan;

4   adapt the plan to satisfy migration constraints;

5   execute at least one move of a data chunk in the plan;

6   modifying the plan based on feedback configuration information regarding in-progress

7   execution of the at least one move; and

8   execute another move in the modified plan.

1   15.   An apparatus for adaptive migration, the apparatus comprising:

2   a planner configured to generate a migration plan based upon configuration information;

3   an adapter configured to receive the plan from the planner, to receive migration

4   constraints information, target configuration information and current configuration information,

5   and to transmit the configuration information to the planner; and

6   at least one executor configured to execute a move in the plan, wherein the configuration

7   information relates to execution of the move.

1   17.   The apparatus of 15, wherein the configuration information further includes load

2   information.

1   18.   The apparatus of 15, further comprising:

2   a load estimator configured to estimate load information for use in determination of the

3   plan.

1   19.   The apparatus of 18, wherein the configuration information includes the estimated load

2   information.

1   20.   The apparatus of claim 15, wherein the adapter iteratively obtains plans from the planner

2   until no moves are pending.

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1   21.   The apparatus of claim 20, wherein the adapter waits for all in-progress executions of
2   moves to complete after no moves are pending.

1   22.   The apparatus of claim 15, wherein the adapter waits for a move to complete if the
2   adapter determines that no moves meet the migration constraints.

1   24.   The apparatus of claim 15, wherein the adapter is configured to select at least one step
2   from the following: prune at least one move that violate a migration constraint; select a largest
3   set of moves that do not violate a migration constraint; and skip a move that violates a migration
4   constraint.

1   25.   The apparatus of claim 15, wherein the adapter is configured to treat a data chunk as
2   existing in an old location and new location while a move is in progress.

1   26.   The apparatus of claim 25, wherein the data chunk is treated by pruning moves that
2   violate an access rule when a move is in progress.

1   27.   The apparatus of claim 25, wherein the data chunk is treated by considering the data
2   chunk as decreasing a per-node free space information at both the old location and the new
3   location when a move is in progress.

1   29.   The method of claim 1, further comprising:
2   executing at least a second move of a data chunk in the modified plan;
3   feeding back information relating to the execution of the at least second move to the
4   planner; and
5   further modifying the plan by the planner in response to the information relating to the
6   execution of the at least second move.

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1 30.   The method of claim 1, wherein execution of the at least one move is performed by an
2 executor, the method further comprising:
3   waiting for the executor to complete the at least one move; and
4   determining whether another move is to be executed;
5   wherein modifying the plan is performed in response to determining that the another
6 move is to be executed.

1 31.   The method of claim 1, further comprising:
2   tracking the information relating to the execution of the at least one move by an adapter
3 that also adapts the plan to satisfy migration constraints,
4   wherein feeding back the information is performed by the adapter to the planner.

1 32.   The article of claim 14, wherein the machine-readable medium further contains
2 instructions to:
3   wait for an executor to complete execution of the at least one move; and
4   determine whether another move is to be executed;
5   wherein modifying the plan is in response to determining that another move is to be
6 executed.

1 33.   The article of claim 14, wherein the machine-readable medium further contains
2 instructions to:
3   estimate load information associated with the plan;
4   wherein modifying the plan is further based on the estimated load information.

1 34.   The apparatus of claim 15, wherein the adapter is configured to further track the
2 configuration information relating to the execution of the move and execution of other moves,
3 and wherein the planner is configured to iteratively modify the migration plan as the tracked
4 configuration information is repetitively fed back to the planner.

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<u>EVIDENCE APPENDIX</u>

None.

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<u>RELATED PROCEEDINGS APPENDIX</u>

None.

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